

FIG 1

Cross section of surface-micromachined high-pressure sensor

09500743-070604  
T09020-E4/00650

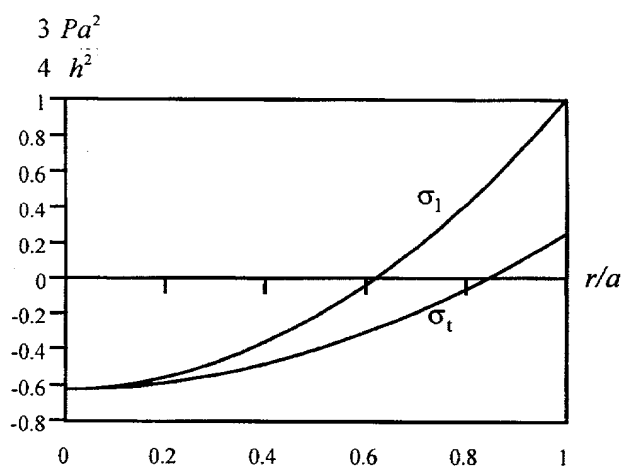


Figure 2 Longitudinal and transverse stress distribution along radius of a circular diaphragm.

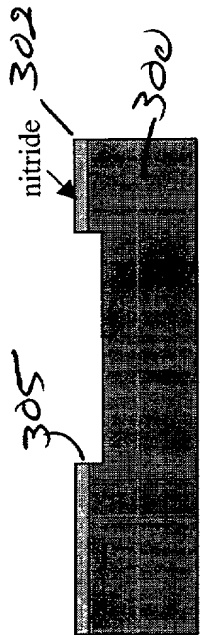


FIG 3A

1. Deposit and pattern nitride.

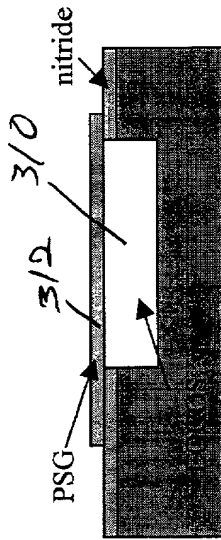


FIG 3B

2. Local oxidation. Deposit and pattern phosphosilicate glass (PSG).

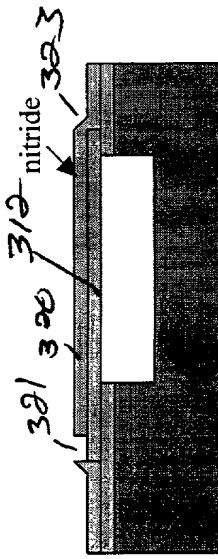


FIG 3C

3. Deposit nitride and open etching holes.

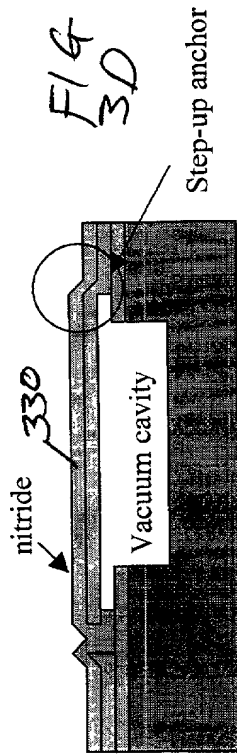


FIG 3D

4. Remove oxide and PSG by 48%HF. Deposit nitride

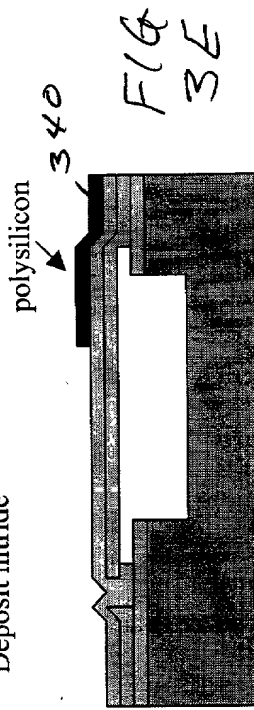


FIG 3E

5. Deposit, dope and pattern polysilicon.

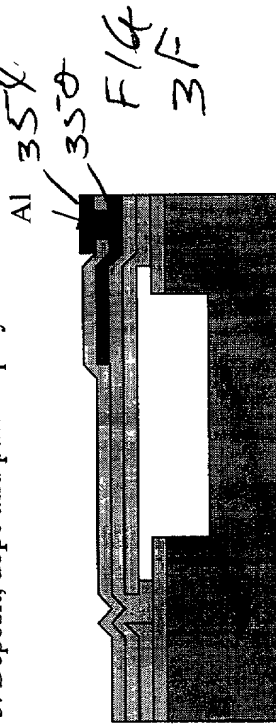
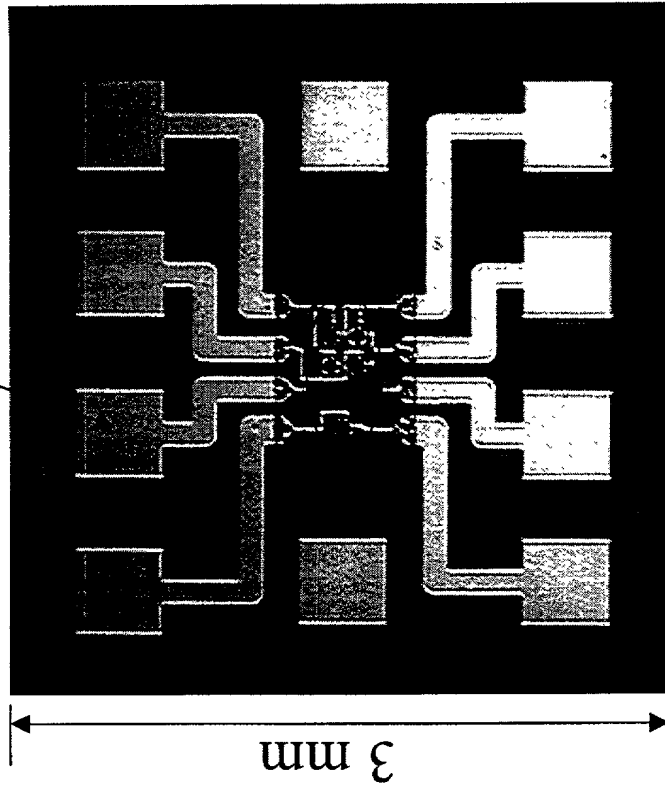


FIG 3F

6. Deposit nitride as passivation layer and Al metallization.

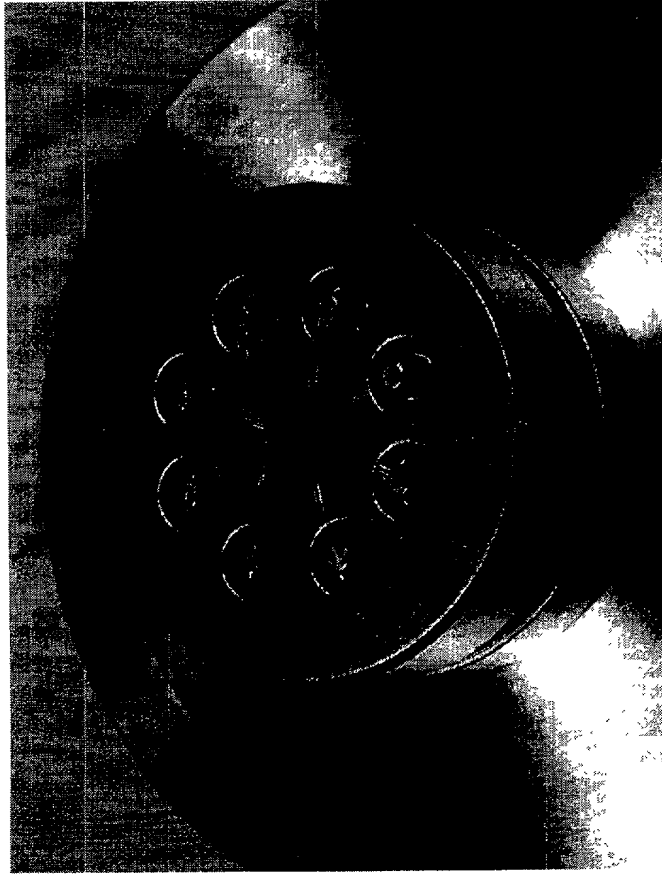
Fig

Al pads



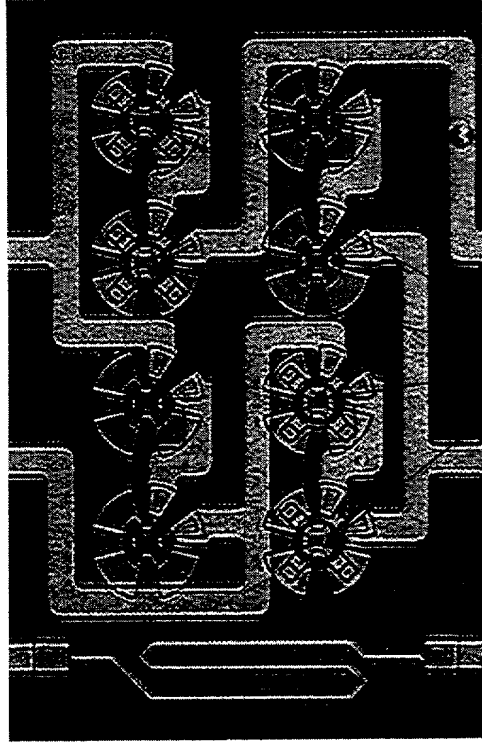
Diced sensor chip

FIG 5

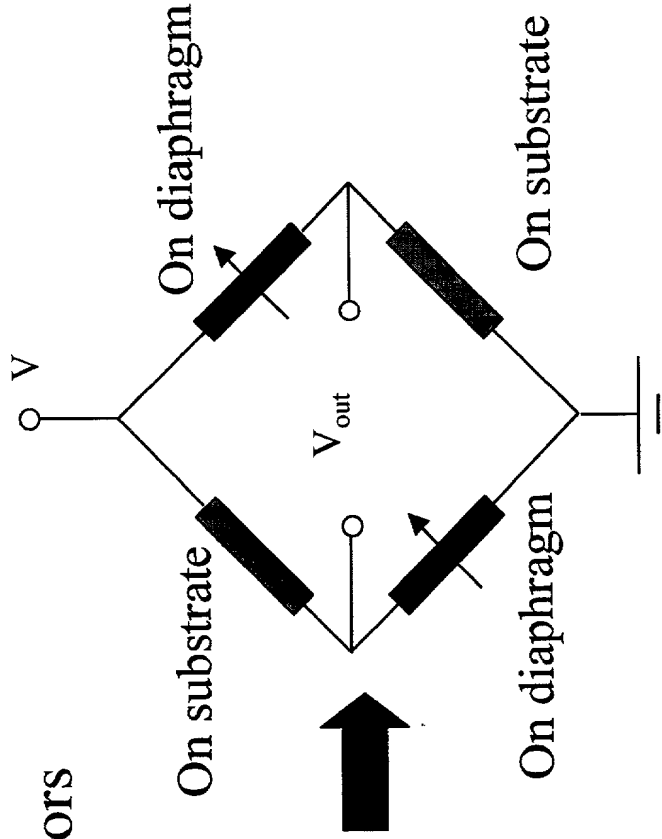


Chip wire-bonded to metal header

Polysilicon thermistor      Pressure sensor:  
8 polysilicon resistors



4 nitride Diaphragms

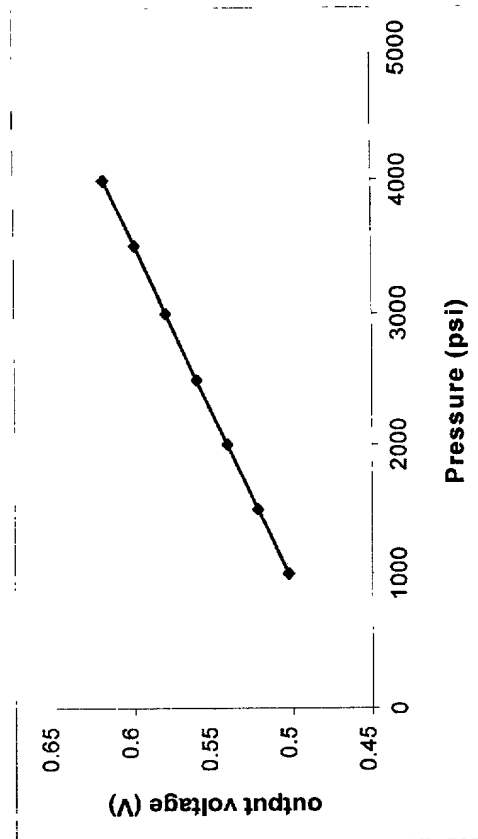


Multi-diaphragm configuration:

- minimize self-heating effect
- make layout much easier

Wheatstone bridge

FIG 6



Calibration curve of the sensor (T = 40 °C)

FIG 7

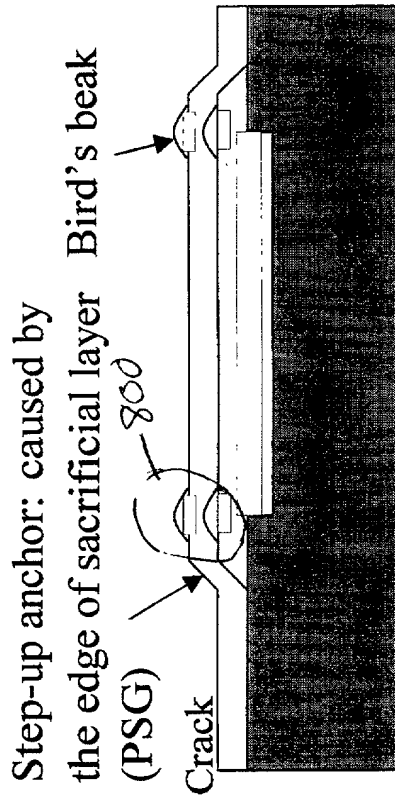


FIG 8

Cross section of sensor diaphragm

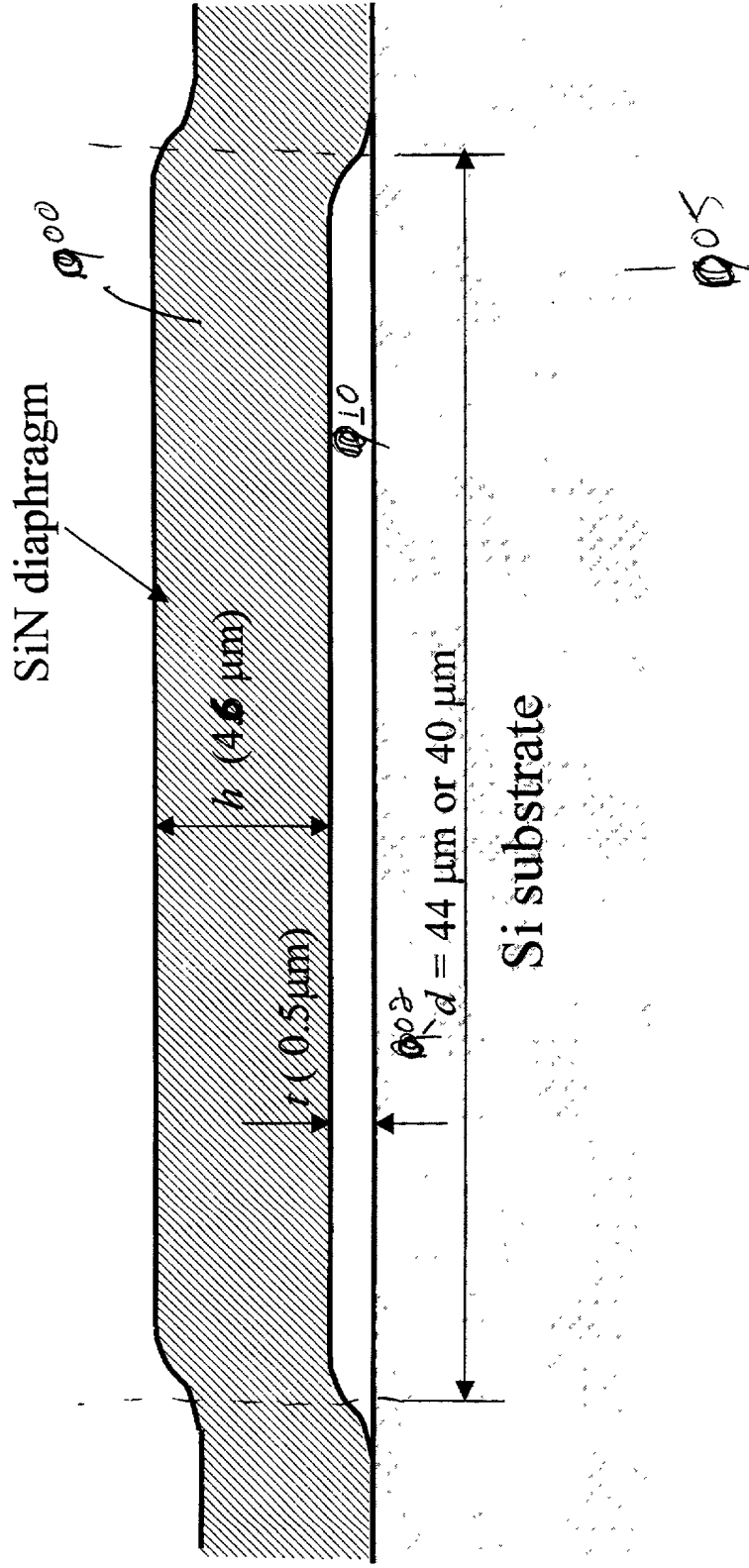
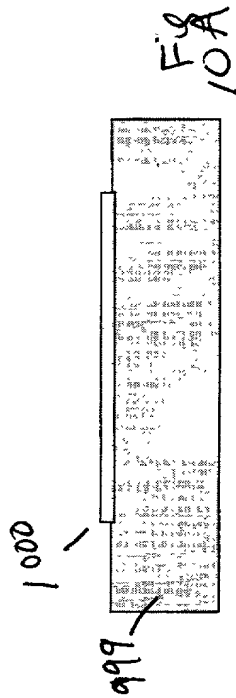
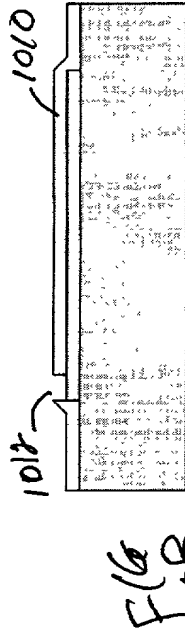


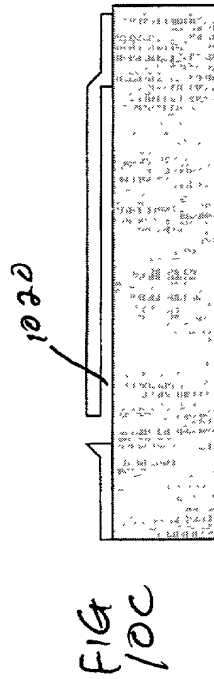
FIG 9



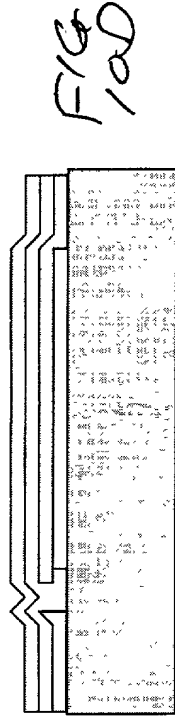
1. Deposit, pattern and reflow  
PSG (mask #1)



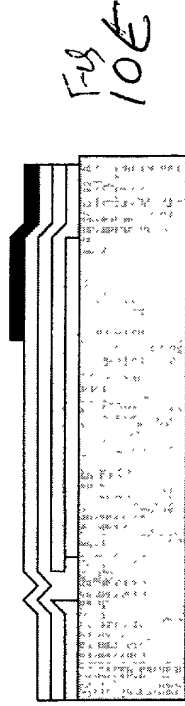
2. Deposit nitride and open etching holes  
(mask #2)



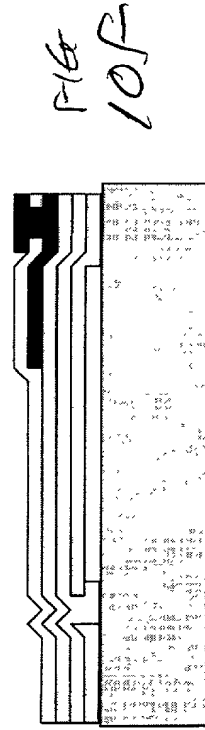
3. Removes PSG by concentrated HF



4. Deposit multi nitride layers



5. Deposit, dope and pattern poly  
(mask #3 and #4)



6. Deposit thin nitride ( 0.2 Om ), open  
contact holes, and Al metalization  
(mask #5 and #6)

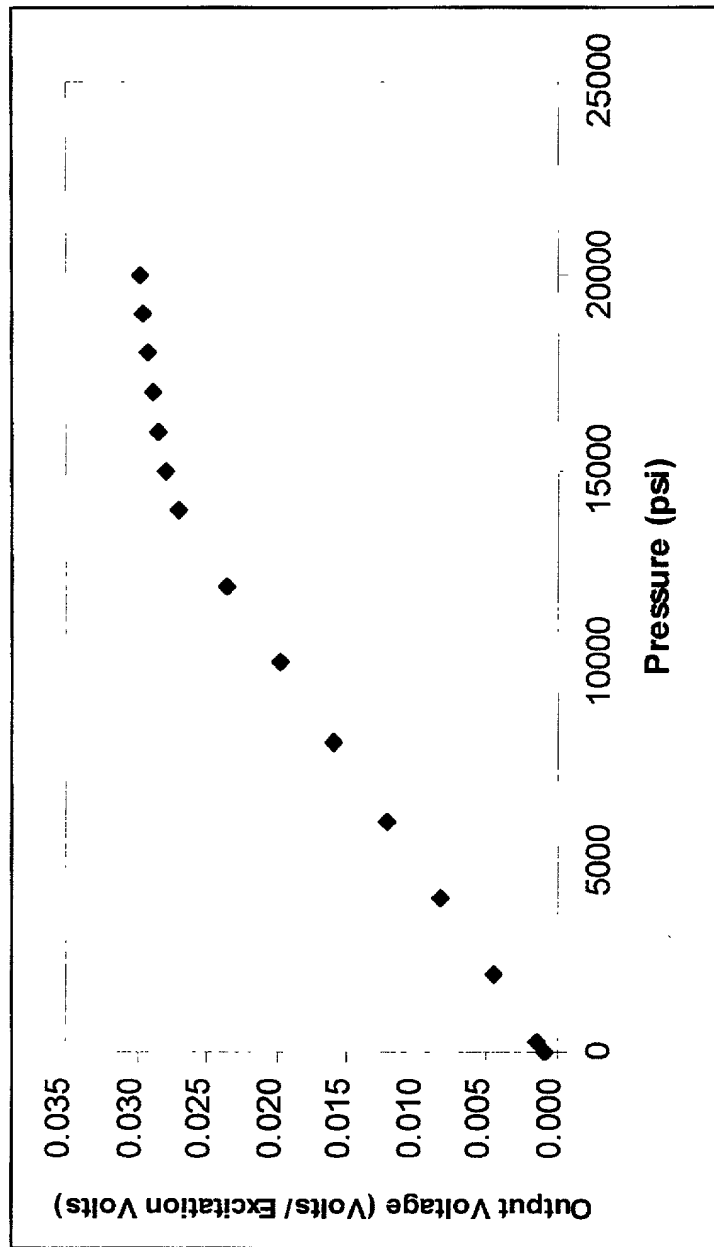
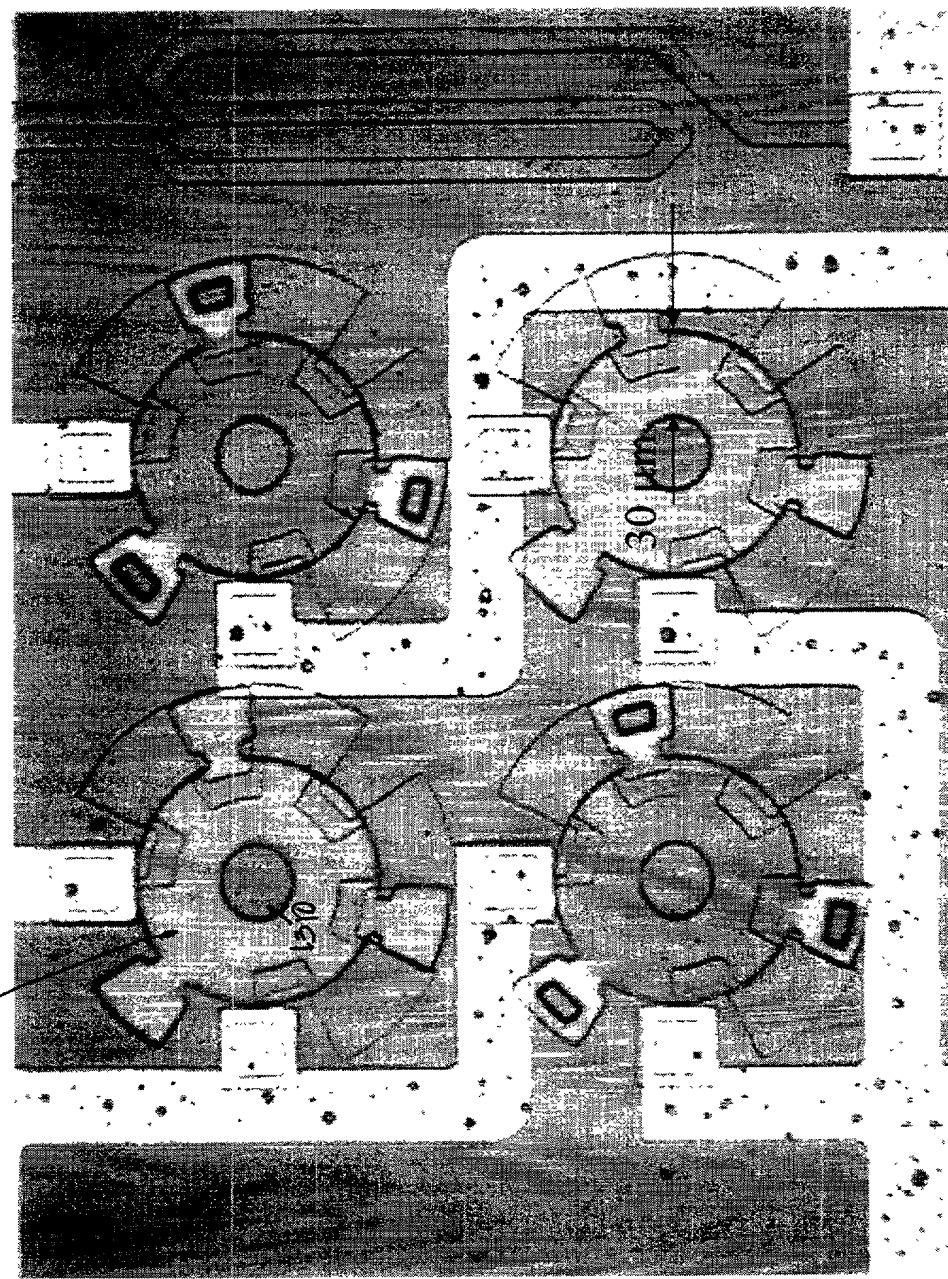


FIG 11

09500743-070601

1305



F16  
18

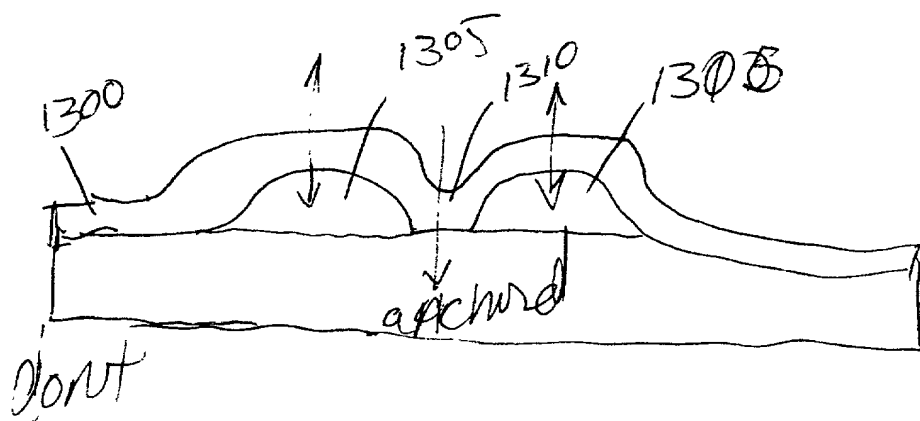


FIG 13